

R E M A R K S

Further reconsideration of the above-identified patent application is respectfully requested in view of the following remarks. Claims 1 through 20 remain in the application.

The invention comprises a method for removing a small layer of copper from copper features forming part of a printed circuit board by using etchants, many of which have been used before, but not without removing large quantities of copper.

The copper is selectively removed in the present invention by applying an inorganic acid etchant, persulfate and phosphate salts. THE APPLICATION SPECIFICALLY PREFERS NOT USING NITRIC ACID BECAUSE IT REMOVES COPPER IN BULK. The basis for this statement is to be found in Applicants' specification starting on page 3, line 4. The specific quote states that:

"...although numerous chemical copper-etchant compositions are known in the art of microelectronic package manufacture, they cannot be [indiscriminately] used in this application since they, by definition, will erode the bulk of the copper. Such etchants include copper or ferric chlorides, chromium salts, alkalin -ammonia, hydrogen peroxide-sulfuric acid or nitric

) acid compositions." Even though it is said that nitric acid
CAN be used, Applicants are NOT using it because it is toxic,
and to interpret the specification otherwise is not realistic.
Please note Applicants' additional reference below, also
eschewing nitric acid.

The specification further states on page 3, line 14,
that: "Nitric acid, either alone or in combination with
sulfuric acid, or copper nitrate, has been reported by Brittey
(United States Patent No. 4,695,348) to be useful for etching
copper in wiring boards. However, [nitrous] oxide gas is a
byproduct of this process."

Furthermore, in claim 5, Applicants specifically state
the inorganic substances being used and this claim does not
recite nitric acid. IT IS RESPECTFULLY CONTENDED THAT THE
OFFICE CANNOT IGNORE WHAT APPLICANT IS CLAIMING AS HIS
INVENTION IN CLAIM 5 AND STATE HERE THAT APPLICANT IS CLAIMING
SOMETHING ELSE IN THE SPECIFICATION. RESPECTFULLY, IT DOES
NOT MAKE SENSE.

) Applicants previously argued that the Japanese reference did not appear to be using its method for microelectronics, and further that it was not a microetching process. The Office has not countered that argument. Does this mean that the Office concedes Applicants' contention? Also, Applicants made the argument that the Japanese reference is old art, and is not concerned with microetching in the sense presented by Applicants' invention. Applicants are using much finer copper wire thicknesses. Bulk copper removal is not the problem for this Japanese reference. The Japanese reference has a whisker forming problem, not a bulk copper removal problem. The Japanese reference is being read into Applicants' invention, and it appears that where it coincides with similar chemistry, it fails by being an opposite teaching (i.e., the problem of growth of the copper (whiskers) versus Applicants' problem of bulk copper removal).

THE OFFICE HAS NOT ANSWERED EITHER OF THE TWO CONTENTIONS

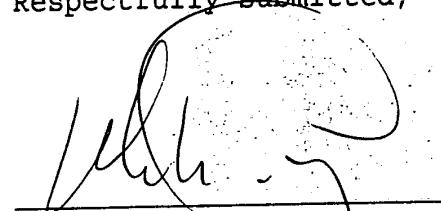
MADE BY APPLICANTS.

Applicants believe that without solving the same problem, the Japanese reference cannot be applied in the statutory

) sense of 35 U.S.C. §103. COMMENT BY THE OFFICE IS NEEDED HERE
TO RESOLVE THESE ISSUES PRIOR TO APPEAL.

In view of the foregoing remarks, Applicants again respectfully request that claims 1 through 20 be allowed and that the application be passed to issue.

Respectfully submitted,


Mark Levy
Registration No. 29,188
Attorney for Applicants
SALZMAN & LEVY
Press Building - Suite 902
19 Chenango Street
Binghamton, New York 13901

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on 5/2/02 (Date of Deposit)
Mark Levy, Reg. 29188 (Date)
Attorney

Phone: (607) 722-6600